

REVIEW

Ecology and Restoration of Northern California Coastal Dunes.—A. J. Pickart and J. O. Sawyer. 1998. California Native Plant Society, Sacramento, 172 pp.

For the first third of the way through, this paperback reads and looks like a natural history book. There are maps, discussions, and photographs of major plant communities (called series so as to parallel vegetation descriptions in the recent *MANUAL OF CALIFORNIA VEGETATION* by John Sawyer and Todd Keeler-Wolf). Information is also included about the biology and autecology of native dune plants and of invasive species that have significantly altered the topography and dynamics of California dunes.

But after this the book steps off into new territory. There is a chapter on restoration planning, including how to select the most discriminating variables to monitor and how to decide on the length of time for monitoring to continue. There is a summary of successes and failures in the removal of invasive plants from California dunes, complete with costs per acre. Restoration can be an expensive undertaking, exceeding the cost of land purchase. For example, it takes about \$35,000 to remove European beach grass (*Ammophila arenaria*) from one acre of dunes. The authors go on to compare the relative merits of removal and control by mechanical, chemical, fire, and other means.

This portion is a rich, detailed guidebook for others to follow elsewhere. Information on restoration includes optimal species to plant, where and when to collect their seeds, how to prepare the dune surface, rates of seed application, how to use vegeta-

tive transplants instead of seeds, whether to use soil amendments (including mycorrhizal inoculation), and how to stabilize the substrate with hydromulch, soil-binding emulsions, straw, netting, sand fences, or short-lived nursery crops.

Pickart and Sawyer's work is a new kind of book, which moves us from passive and descriptive natural history descriptions to activist and prescriptive restoration work. Many conservationists conclude that it is time for us to shift focus from preservation to restoration; that we should turn our attention to the matrix of degraded habitats that make up 90% of our landscapes, and to promote their enhancement.

A short final chapter addresses the role of restoration in conservation. "Skeptics fear," they write, "that restoration will be used . . . to justify the destruction of remaining areas." To counter such an argument, they point out the current poor status of restoration knowledge, the modest record of restoration success, and our dismal ability to monitor restoration projects in a way that we could learn from the failures. Clearly, restoration ecology is in an early stage of development and cannot be relied upon to take the place of more traditional conservation and preservation activities. Restoration, however, can and should accompany conservation and preservation.

Although the book limits itself to the California coast north of Sonoma County, its philosophical content and importance spill over to the entire Pacific Coast, from Baja California to Alaska.

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